DEPARTMENT OF NATURAL RESOURCES
ADMINISTRATION BUILDING
WATER SUPPLY NETWORK REPLACEMENT
SALT LAKE CITY, UTAH

DFCM PROJECT # 04206500

State of Utah—Department of Administrative Services

DIVISION OF FACILITIES CONSTRUCTION AND MANAGEMENT

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SPECIFICATIONS

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JANUARY 2005

WHW Engineering Project # 04048

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INDEX

SECTION 01100 - SUMMARY OF THE WORK

PART 1 - GENERAL

1.1 Descriptive Summary of the Work:

A. Without force and effect on the requirements of the Contract Documents, the description of the work of the Contract is summarized as follows:

1.2 Scope of the Work:

A. Replace all existing culinary hot and cold water piping, fittingS etc and replace with Type L copper pipe.
B. Provide new electric hot water heater and one drinking fountain and the water header.
C. The contractor is responsible for the complete execution of the Contract Documents as indicated and specified. He is responsible for the work performed, the acts and omissions of his sub-contractors and suppliers and of persons either directly or indirectly employed by them, as well as the work, acts and omissions of persons directly employed by him.
D. Provide, without additional charge, all incidental items required to complete the work even though not specifically indicated. Install all work so that its several component parts function together as a workable system, and with all equipment properly adjusted and in working order.
E. Conform to the highest quality standards for materials and workmanship as required to execute work indicated, specified and necessary to fully satisfy the Contract requirements for a complete, finished and acceptable installation.
F. The contractor is responsible to verify all field measurements of actual site conditions so that all work fits properly in the locations indicated and specified. Protect existing structures, improvements, etc. from physical damage.
G. Upon completion of the project, dismantle and remove from the site all barricade and construction materials.
H. Any existing items which are damaged by the contractor shall be restored to their original or better condition to the satisfaction of the Owner.

1.3 Contractor use of Premises:

A. General: During the Construction period, the Contractor will have full use of the designated portions of the Owner's property necessary to perform the work, store a reasonable amount of materials, placement of temporary facilities, and similar uses. The Contractor's use of the premises is limited insofar as Owner operations in existing facilities is concerned.
    1. The existing building, property and parking area will remain fully operational throughout the Construction Period. This work must be conducted in such a manner that no interference with such operations or with the safety of Owner’s employees, or the public.

1.4 Permit Fees:

A. DFCM does not require fees or permits and is the Governing Authority on this project.
B. Other incidental fees required by other municipal agencies or utility companies are the responsibility of the Contractor.

1.5 Interruption of Existing Utilities:

A. Whenever the work of this contract requires the temporary shutdown of any existing utilities, notify Physical Facilities Director 72 hours in advance and obtain written permission from him before shutting off any existing utilities. Minimize the interruption of plumbing and electrical services which may affect other portions of the building.

1.6 Construction Documents:

A. The Working Drawings constitute the visual construction guide.
B. Working Drawings and Specifications are complimentary to each other and what is called for by one is as binding as if called for and defined by both. In case of conflict between the two, the Specifications take precedence unless they are obviously in error. Figured dimensions take precedence over scale measurements.
C. In no case are manufacturer's or supplier's shop drawings to nullify, take precedence of, or supplant the Working Drawings.
D. Specification Divisions are divided into the standard construction industry major divisions with all work being categorized into one such division. Individual elements of the work are subdivided into sections within each division. Such assignment of the work is not intended to limit the manner in which the Contractor chooses to assign the work.

1.7 Owner Occupancy:

A. Partial Owner Occupancy: The Owner reserves the right to occupy all areas of the building, prior to Substantial Completion provided that such occupancy does not interfere with completion of the work. Occupancy shall not constitute acceptance of the total work. All areas of the building shall remain in full use during construction.

PART 2-PRODUCTS
(Not Used)

PART 3-EXECUTION
(Not Used)

END OF SECTION 01100

SECTION 01200 - DEFINITIONS AND STANDARDS

PART 1-GENERAL

1.1 Definitions:

A. General: Except as specifically defined otherwise, the following definitions shall supplement definitions of the Contract, General Conditions, Supplementary Conditions and other general contract documents, and apply generally to the work.

B. General Requirements: The provisions of Division-1 sections, General Requirements, apply to the entire work of the Contract.

C. Indicated: Shown on drawing by notes, graphics or schedules, or written into other portions of contract documents. Terms such as "shown", "noted", "schedules", and "specified" have same meaning as "indicated", and are used to assist the reader in locating particular information.

D. Directed, Requested, Approved, Accepted, etc.: These terms imply "by the Architect/Engineer", unless otherwise indicated.

E. Approved by Architect/Engineer: In no case releases Contractor from responsibility to fulfill requirements of contract documents.

F. Project Site: Space available to Contractor at location of project, either exclusively or to be shared with separate contractors, for performance of work.

G. Furnish: Supply and deliver to project site, ready for unloading, unpacking, assembly, installation, and similar subsequent requirements.

H. Install: Operations at project site, including unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning and similar requirements.

1. Provide: Furnish and install, complete and ready for intended use.

I. Installer: Entity (firm or person) engaged to install work, by Contractor, subcontractor or sub-sub contractor. Installers are required to be skilled in work they are engaged to install.

J. Specification Text Format: Underscoring facilities scan reading, no other meaning. Imperative language is directed at Contractor, unless otherwise noted.

K. Overlapping/Conflicting Requirements: Most stringent (generally) requirement written directly into the contract documents is intended and will be enforced, unless specifically detailed language written into the contract documents clearly indicates that a less stringent requirement is acceptable. Refer uncertainties to the Architect/Engineer for a decision before proceeding.

1. Where optional requirements are specified in a parallel manner, option is intended to be Contractor's unless otherwise indicated.

L. Minimum Requirements: Indicated requirements are for a specific minimum acceptable level of quality/quantity, as recognized in the industry. Actual work must comply (within specified tolerances), or may exceed minimums within reasonable limits. Refer uncertainties to Architect/Engineer before proceeding.

M. Abbreviations, Plural Words: Abbreviations, where not defined in contract documents, will be interpreted to mean the normal construction industry terminology, determined by recognized grammatical rules, by the Architect/Engineer. Plural words will be interpreted as singular and singular

words will be interpreted as plural where applicable for context of contract of documents.

N. Testing laboratory: An independent entity engaged for the project to provide inspections, tests, interpretations, reports and similar services.

1.2 Standards and Regulations:

A. Industry Standards: Applicable standards of construction industry have same force and effect on performance of the work as if copied directly into contract documents or bound and published therewith. Standards referenced in contract documents or in governing regulations have precedence over non-referenced standards, insofar as different standards may contain overlapping or conflicting requirements. Comply with standards in effect as of date of contract documents, unless otherwise indicated.

1. Abbreviations: Where abbreviations or acronyms are used in contract documents, they mean the well recognized name of entity in building construction industry; refer uncertainties to Architect/Engineer before proceeding, or consult "Encyclopedia of Associations" by Gale Research Co.

PART 2-PRODUCTS

(Not Used)

PART 3-EXECUTION

(Not Used)

END OF SECTION 01200

SECTION 01300 - PROCEDURES AND CONTROLS

PART 1 - GENERAL

1.1 ADMINISTRATION AND SUPERVISION:

A. Coordination: Coordinate various elements of the work and entities engaged to perform work; and coordinate the work with existing facilities/conditions, and Owner.

1.2 CONSTRUCTION PROGRESS DOCUMENTATION:

A. Project Schedule
   1. General Requirements -
      a) Submit project schedule for the Work.
      b. Clearly explain abbreviations used in schedule in legend of symbols.
   2. Schedule Requirements -
      a) Schedule shall clearly show sequential interdependencies, with activity duration and float clearly represented. Sequence of activities with no float shall be clearly identified.
      b) Activity durations shall be in work days.
      c) Activity Content -
         1) Schedule shall include but not limited to the following activities as they apply to Project.
            a] Delivery schedules.
            b] Construction tasks (maximum 20 day duration for any activity).
            c] Shop drawings submittal and approval process.
            d] Ordering, fabrication, and delivery of major materials and equipment.
            e] Submittals of record drawings.
            f] Clean up and punch out tasks.
            g] Critical coordination activities required to insure timely support and inspections.
            h] Pre-final, final inspections and substantial completion.
            i] Final payment.
         2) Schedule submittal activities to allow sufficient time for work to be procured and installed, even if submittal is unacceptable and resubmittal is required.
         3) Schedule shall reflect anticipated delays, such as electrical power change overs. Also, such items as weather delays, allowing normal weather conditions as agreed upon by Owner and Contractor.
   2. Schedule Changes And Updates -
      1) Update Schedule and submit for review monthly at minimum. Weekly update is recommended. Monthly submittal of schedule

and acceptable by Owner is a prerequisite to payment for work which payment is requested.

a) Correlate Schedule of Values graphically with schedule for evaluation of Payment Request.
b) Manner by which correlation is accomplished shall be subject to review by Owner.

1.3 INSTALLATION, GENERAL:

A. Comply with manufacturer's instructions and recommendations to extent printed information is more detailed or stringent than requirements contained directly in contract documents.
B. Timing: Install work during time and under conditions which will ensure best possible results, coordinated with required inspection and testing. Timing is of the up most importance.

1.4 CLEANING AND PROTECTION:

A. General: Clean each element of work at time of installation. Provide sufficient maintenance and protection during construction to ensure freedom from damage and deterioration at time of substantial completion.

PART 2 - PRODUCTS

(Not Used)

PART 3 - EXECUTION

(Not Used)

END OF SECTION 01300

SECTION 01330 - PROJECT MEETINGS

PART 1-GENERAL

1.1 PRECONSTRUCTION CONFERENCE:

A. DFCM and Engineer will schedule preconstruction conference and organizational meeting at Project site or other convenient location by 15 days after issuance of Notice To Proceed. DFCM will conduct meeting to review responsibilities and personnel assignments.

B. Attenders - Owner, Engineer, Contractor and his superintendent, major Subcontractors and other concerned parties shall each be represented at conference by persons familiar with and authorized to conclude matters relating to the Work.

C. Agenda - Discuss items of significance that could affect progress including such topics as

1. Tentative construction schedule.
2. Critical Work sequencing.
3. Designation of responsible personnel.
4. Procedures for processing interpretations and Modifications.
5. Procedures for processing Payment Requests.
6. Submittal of Product Data, Shop Drawings, Quality Assurance/Control submittals.
7. Preparation of record documents.
8. Use of the premises.
9. Office, work, and storage areas.
10. Equipment deliveries and priorities.
11. Safety procedures.
12. First aid.
13. Security.
14. Housekeeping.
15. Working hours.
16. Resolving current problems.
17. Further orientation as to requirements of Contract Documents.
18. Engineer’s responsibility to Owner for inspection.
19. Working out general schedule of Engineer’s inspection.

D. Engineer will record significant discussions and agreements and disagreements of each meeting and distribute minutes of meeting to everyone concerned, including Owner, within five working days.

1.2 PROGRESS MEETINGS:

A. Engineer will conduct progress meetings at Project site at regularly scheduled intervals.

B. Owner, Engineer, Contractor, and each Subcontractor concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings by persons familiar with Project and authorized to conclude matters relating to progress.

C. Agenda -

1. Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
2. Progress since last meeting will be reviewed. Where each activity is in relation to Contractor's Construction Schedule, whether on time or ahead or behind schedule, will be determined. How construction behind schedule is to be expedited will be decided and commitments secured from parties involved to do so. Schedule revisions required to ensure that current and subsequent activities will be completed within Contract Time will be discussed.
3. Present and future needs of each entity present will be discussed, including such items as -
   a) Interface requirements.
   b) Time.
   c) Sequences.
   d) Deliveries.
   e) Off-site fabrication problems.
   f) Access.
   g) Site use.
   h) Temporary facilities and services.
   i) Hours of work.
   j) Hazards and risks.
   k) Housekeeping.
   l) Quality and Work standards.
   m) Modifications.
   n) Documentation of information for Payment Requests.

D. Engineer will include brief summary, in narrative form, of progress since previous meeting. By five days after each progress meeting date, Engineer will distribute copies of minutes of meeting to each party present and to parties who should have been present, including Owner.

E. Revise Contractor's Construction Schedule after each progress meeting where revisions to schedule have been made or recognized. Issue revised schedule by five days after each progress meeting date, to each party present and to parties who should have been present, including Owner.

PART 2-PRODUCTS

(Not Used)

PART 3-EXECUTION

(Not Used)

END OF SECTION 01330

SECTION 01400 - PROJECT CLOSEOUT

PART 1-GENERAL

1.1 Related Documents:

A. Drawings and general provisions of contract, including General and Supplementary Conditions and other division 1 specification sections shall apply to this section.

1.2 Summary:

A. This section specifies administrative and procedural requirements for project closeout, including but not limited to:
   1. Inspection procedures.
   2. Project record document submittal.
   3. Submittal of warranties.
   4. Final cleaning.

1.3 Substantial Completion:

A. **Preliminary Procedures:**
   1. Before requesting inspection for certification of substantial completion, complete the following. List any exceptions in the request.
   2. In the application for payment that coincides with, or first follows, the date substantial completion is claimed, show 100 percent completion. Include supporting documentation for completion as indicated in these contract documents and a statement showing an accounting of changes to the contract sum.
      a) If 100 percent completion cannot be shown, include a list of incomplete items, the value of incomplete construction, and reasons the work is not complete.

B. Advise Owner of pending insurance change-over requirements.

C. Submit specific warranties, workmanship bonds, maintenance agreements, final certifications and similar documents.

D. Obtain and submit releases enabling the owner unrestricted use of the work and access to services and utilities.

E. Submit record drawings, and other similar final record information.

F. Deliver spare parts, extra stock, and similar items.

G. Complete testing of new system and instruction of the Owner's operating and maintenance personnel. Remove all construction tools, and similar elements.

H. Complete final clean up requirements, including touch-up painting. Touch-up and otherwise repair and restore new and existing marred exposed finishes.

1.4 Inspection Procedures:

A. On receipt of a request for inspection, the Engineer will either proceed with inspection or advise the contractor of unfilled requirements. The Engineer will

prepare the Certificate of Substantial Completion following inspection, or advise the contractor of construction that must be completed or corrected before the certificate will be issued.

1. The Engineer will repeat inspection when requested and assured that the work has been substantially completed.
2. Results of the completed inspection will form the basis of requirements for final acceptance.

1.5 Final Acceptance:

A. Preliminary Procedures
   1. Before requesting final inspection for certification of final acceptance and final payment, complete the following. List exceptions in the request.

B. Submit the final payment request with releases and supporting documentation not previously submitted and accepted. Include certificates of insurance for products and completed operations where required.

C. Submit an updated final statement, accounting for final additional changes to the contract sum.

D. Submit a certified copy of the Engineer's final inspection list of items to be completed or corrected, stating that each item has been completed or otherwise resolved for acceptance, and the list has been endorsed and dated by the Engineer.
   1. Submit consent of surety of final payment.
   2. Submit a final liquidated damages settlement statement.
   3. Submit evidence of final, continuing insurance coverage complying with insurance requirements.

1.6 Reinspection Procedure:

A. The Engineer will reinspect the work upon receipt of notice that the work, including inspection list items from earlier inspections, has been completed, except items whose completion has been delayed because of circumstances acceptable to the Owner and Engineer.
   1. Upon completion of reinspection, the Engineer will prepare a certificate of final acceptance, or advise the contractor of work that is incomplete or of obligations that have not been fulfilled but are required for final acceptance. If necessary, reinspection will be repeated **at a cost to the Contractor**.

1.7 Record Document Submittals:

A. General:
   1. Do not use record documents for construction purposes; protect from deterioration and loss in a secure, fire-resistive location; provide access to record documents for the Engineer's reference during normal working hours.

1.8 Record Drawings:

A. Maintain a clean, undamaged set of blue or black line white prints of contract drawings and shop drawings. Mark the set to show the actual installation where the installation varies substantially from the work as originally shown. Mark whichever drawing is most capable of showing conditions fully and accurately. Give particular attention to concealed elements that would be difficult to measure and record at a later date.
   1. Mark record sets with red erasable pencil; use other colors to distinguish between variations in separate categories of the work.
   2. Mark new information that is important to the Owner, but was not shown on the contract drawings or shop drawings.
   3. Note related change order numbers where applicable.
   4. Organize record drawing sheets into manageable sets, bind with durable paper cover sheets, and print suitable titles, dates and other identification on the cover of each set.

1.9 Final Cleaning:

A. General cleaning during construction is required by the General Conditions.
   1. **Cleaning:** Employ experienced workers or professional cleaners for final cleaning. Comply with manufacturer's instructions.

1.10 Removal of Protection:

A. Remove temporary protection and facilities installed for protection of the work during construction.

1.11 Compliance:

A. Comply with regulations of authorities having jurisdiction and safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on the Owner's property. Do not discharge volatile, harmful or dangerous materials into drainage systems. Remove waste materials from the site and dispose of in a lawful manner.
   1. Where extra materials of value remain after completion of associated work arrange for disposition of these materials as directed.

PART 2-PRODUCTS
(Not Used)

PART 3-EXECUTION
(Not Used)

END OF SECTION 01400

DIVISION 09
FINISHES

SECTION 09250 - GYPSUM WALLBOARD

PART 1 GENERAL

1.1 SCOPE

A. Includes But Not Limited To
   1. Furnish and install gypsum wallboard for wall replacement where required for removal or replacement of piping.

1.2 REFERENCES

A. Gypsum Association
   1. GA-214-90 - 'Recommended Specification: Levels of Gypsum Board Finish'

B. American Society For Testing And Materials
   1. ASTM C 36-97, 'Standard Specification for Gypsum Wallboard'
   2. ASTM C 475-94, 'Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board'
   3. ASTM C 840-98, 'Standard Specification for Application and Finishing of Gypsum Board'

1.3 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in original packages, containers, or bundles bearing brand name, applicable standard designation, and Manufacturer's name.

B. Store material under roof and keep dry. Stack gypsum board flat and protect from damage.

PART 2 PRODUCTS

2.1 MATERIALS

A. Gypsum Board - Any manufacturer's product meeting requirements of ASTM C 36, Type X, UL one-hour rated, tapered edge, face paper suitable for painting.

2.2 ACCESSORIES

A. Gypsum Wallboard Mounting Accessories
   1. Acceptable Products -
      a) Furring Channels -
         1) Walls - Galvanized USG DWC-25
      b) Resilient Channels - RC-1 by USG
      c) Other accessories as required by Manufacturer's fire tests to provide necessary fire ratings.
      d) Equal as approved by Engineer before installation.

B. Joint Compound

1. Best grade or type recommended by Wallboard Manufacturer and meeting requirements of ASTM C 475.
    a) Use Taping Compound for first coat to embed tape and accessories.
    b) Use Taping Compound or All-Purpose Compound for subsequent coats except final coat.
    c) Use Finishing Compound for final coat and for skim coat.

C. Joint Reinforcing - Paper reinforcing tape acceptable to Wallboard Manufacturer.

D. Fasteners
1. Bugle head screws meeting requirements of ASTM C 1002.
    a) Types -
        1) Type W - For fastening gypsum board to wood members.
        2) Type S - For fastening gypsum board to steel framing.
    b) Lengths -
        1) Of length to penetrate wood framing 5/8 inch minimum.
        2) Of length to penetrate steel framing 3/8 inch minimum.

PART 3 EXECUTION

3.1 INSTALLATION

A. General - Install and finish as recommended in ASTM C 840.

B. Gypsum Wallboard
1. General -
    a) Install so trim and reinforcing tape are fully backed by gypsum wallboard. No hollow spaces between pieces of gypsum board over 1/8 inch wide before taping are acceptable.
    b) Rout out backside of gypsum board to accommodate items which extend beyond face of framing, but do not penetrate face of gypsum board, such as metal door frame mounting brackets, etc.
2. Single Layer Application -
    a) Use board of length to give minimum number of joints.
    b) On walls over 108 inches high and on ceilings, apply board perpendicular to support.
    c) Stagger end joints. End joints of board horizontally applied on walls shall occur over framing members. Edge joints of board vertically applied on walls shall occur over framing members.
    d) Butt edges in moderate contact. Do not force in place. Shim to level.
    e) Leave facings true with joint, finishing flush. Vertical work shall be plumb and ceiling surfaces level.
    f) Scribe work closely. Keep joints as far from openings as possible. if joints occur near an opening, apply wallboard so vertical joints are centered over openings. No vertical joints shall occur within 8 inches of external corners or openings.
    g) Install board tight against support with joints even and true. Tighten loose screws.
3. Fastening -

a) Apply from center of wallboard towards ends and edges.
b) Apply screws 3/8 inch minimum from ends and edges, one inch maximum from edges, and 1/2 inch maximum from ends.
c) Spacing -
1) Ends - Screws not over 7 inches on center at edges where blocking or framing occurs.
2) Wood Framed Walls And Ceilings - Screws 7 inches on center in panel field.
3) Metal Framed Walls - Screws 12 inches on center in panel field.
d) Set screw heads 1/32 inch below plane of board, but do not break face paper. If face is accidentally broken, apply additional screw 2 inches away.
e) Screws on adjacent ends or edges shall be opposite each other.
f) Drive screws with shank perpendicular to face of board.

C. Finishing
1. General -
a) Tape and finish joints and corners as specified below to correspond with final finish material to be applied to gypsum board. When sanding, do not raise nap of gypsum board face paper or paper-faced trim.
b) First Coat -
1) Apply tape over center of joint in complete, uniform bed of specified taping compound. If metal corner bead is used, apply reinforcing tape over flange of metal corner bead and trim so half of tape width is on flange and half is on gypsum wallboard.
2) Completely fill gouges, dents, and fastener dimples.
3) Allow to dry and sand lightly if necessary to eliminate high spots or excessive compound.
c) Second Coat -
1) Apply coat of specified joint compound over embedded tape extending 3-1/2 inches on both sides of joint center. Use finishing compound only if applied coat is intended as final coat.
2) Re-coat gouges, dents, and fastener dimples.
3) Allow to dry and sand lightly to eliminate high spots or excessive compound.
d) Third Coat - Apply same as second coat except extend application 6 inches on both sides of joint center. Allow to dry and sand with fine sandpaper or wipe with damp sponge.
e) Fourth Coat - Apply same as second coat except extend application 9 inches on both sides of joint center. Allow to dry and sand with fine sandpaper or wipe with damp sponge.
2. Finishing Levels -
a) Unfinished Gypsum Board Surfaces And Under Acoustical Tile -
1) GA-214-90 Level Two - 'All joints and interior angles shall have tape embedded in joint compound and one separate

coat of joint compound applied over all joints, angles, fastener heads, and accessories. Surface shall be free of excess joint compound. Tool marks and ridges are acceptable,' except under acoustic tile.

b) Gypsum Board Surfaces

1) GA-214-90 Level Three - 'All joints and interior angles shall have tape embedded in joint compound and two separate coats of joint compound applied over all joints, angles, fastener heads, and accessories. All joint compound shall be smooth and free of tool marks and ridges.'

3.2 CLEANING

A. Remove from site debris resulting from work of this Section including taping compound spills.

END OF SECTION 09250

SECTION 09900 - PAINTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification sections, apply to this section.

1.2 DESCRIPTION OF WORK:

A. Work includes field painting new gypsum wallboard if required, damaged surfaces and exposed hangers and supports,

B. "Paint" as used herein, means all coating systems materials, primers, enamels, sealers and fillers, and other applied materials whether used as prime, intermediate, or finish coats.

C. Surfaces to be Painted: Except where natural finish of material is specifically noted as a surface not to be painted, paint exposed surfaces whether or not colors are designated. Where items or surfaces are not specifically mentioned, paint the same as similar adjacent materials or areas. If color or finish is not designated, engineer will select these from standard colors or finishes available.

D. Following categories of work are not included as part of field-applied finish work.
   1. Pre-finished Items: Unless otherwise indicated, do not include painting when factory-finishing is specified.
   2. Concealed Surfaces: Unless otherwise indicated, painting is not required on surfaces such as walls or ceilings in concealed areas and generally inaccessible areas, foundation spaces, furred areas etc.
   3. Finished Metal Surfaces: Unless other wise indicated, metal surfaces of anodized aluminum, chromium plate, bronze and similar finished materials will not require finish painting.
   4. Operating Parts: Unless otherwise indicated, moving parts of operating units, mechanical and electrical parts, such as valve and damper operators, linkages, sensing devices, motor and fan shafts will not require finish painting.

E. Do not paint over any code-required labels, such as Underwriters' Laboratories and Factory Mutual, or any equipment identification, performance rating, name, or nomenclature plates.

1.3 QUALITY ASSURANCE

A. Single-Source Responsibility: Provide primers and undercoat paint produced by the same manufacturer as the finish coats. Use only thinners approved by paint manufacturer, and use only within recommended limits.

B. Coordination of Work: Review other sections in which primers are provided to ensure compatibility of the total systems for various substrates. On request, furnish information on characteristics of finish materials to ensure use of compatible primers.

1.4 DELIVERY AND STORAGE:

A. Deliver materials to the job site in the manufacturer's original, unopened packages and containers bearing manufacturer's name and label and the following information:
   1. Product name or title of material.
   2. Manufacturer's stock number and date of manufacture.
   3. Manufacturer's name.
   4. Contents by volume, for pigment and vehicle constituents.
   5. Thinning instructions.
   6. Application instructions.
   7. Color name and number.

B. Store materials not in use in tightly covered containers in a well- ventilated area at a minimum ambient temperature of 45 deg F (7 deg C). Maintain containers used in storage in a clean condition, free of foreign materials and residue.
   1. Protect from freezing. Keep storage area neat and orderly. Remove oily rags and waste daily. Take necessary measures to ensure that workers and work areas are protected from fire and health hazards resulting from handling, mixing, and application.

1.5 JOB CONDITIONS

A. Apply water-based paints only when the temperature of surfaces to be painted and surrounding air temperatures are between 50 deg F (10 deg C) and 90 deg F (32 deg C).

B. Apply solvent-thinned paints only when the temperature of surfaces to be painted and surrounding air temperatures are between 45 deg F (7 deg C) and 95 deg F (35 deg C).

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the work include but are not limited to the following:
   1. Benjamin Moore and Co. (Moore) or approved equal by.
   2. Devoe and Raynolds Co. (Devoe).
   3. The Glidden Company (Glidden).
   4. PPG Industries, Pittsburgh Paints (Pittsburgh).
   5. Pratt and Lambert (P & L).
   6. The Sherwin-Williams Company (S-W).
   7. Kwal-Howells Company

2.2 MATERIALS:

A. Material Quality: Provide best quality grade of various tubes of coatings as regularly manufactured by acceptable paint materials manufacturer's. Materials

not displaying manufacturer's identification as a standard, best-grade product will not be acceptable.

B. Color Pigments: Pure, non-fading, applicable types to suit substrates and service indicated.
   1. Do not use red-lead base paints.

PART 3 - EXECUTION

3.1 INSPECTION:

A. Applicator must examine substrates and conditions under which painting will be performed for compliance with requirements for application of paint. Do not begin paint application until unsatisfactory conditions have been corrected.
   1. Start of painting will be construed as the Applicator's acceptance of surfaces and conditions within a particular area.
   2. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions otherwise detrimental to formation of a durable paint film.

3.2 SURFACE PREPARATION

A. General Procedures: Perform preparation and cleaning procedures in accordance with paint manufacturer's instructions and as herein specified, for each particular substrate condition.
   1. Provide barrier coats over incompatible primers or remove and reprime as required. Notify Engineer in writing of any anticipated problems in using the specified coating systems with substrates primed by others.
   2. Remove hardware and hardware accessories, plates, machined surfaces, lighting fixtures, and similar items in place that are not to be painted, or provide surface-applied protection prior to surface preparation and painting. Remove these items if necessary for complete painting of the items and adjacent surfaces. Following completion of painting operations in each space or area, have items reinstalled by workers skilled in the trades involved.
   3. Clean surfaces before applying paint or surface treatments. Remove oil and grease prior to cleaning. Schedule cleaning and painting so that dust and other contaminants from the cleaning process will not fall on wet, newly painted surfaces.
   4. Ferrous Metals: Clean nongalvanized ferrous-metal surfaces that have not been shop coated; remove oil, grease, dirt, loose mill scale, and other foreign substances. Use solvent or mechanical cleaning methods that comply with recommendations of the Steel Structures Painting Council.
      a) Touch up bare areas and shop-applied prime coats that have been damaged. Wire-brush, clean with solvents recommended by the paint manufacturer, and touch up with the same primer as the shop coat.
   5. Galvanized Surfaces: Clean galvanized surfaces with non-petroleum-based solvents so that the surface is free of oil and surface contaminants. Remove pretreatment from galvanized sheet

metal fabricated from coil stock by mechanical methods.

3.3 MATERIALS PREPARATION:

A. Mix and prepare paint materials in accordance with manufacturer's directions.
   1. Maintain containers used in mixing and application of paint in a clean condition, free of foreign materials and residue.
   2. Stir material before application to produce a mixture of uniform density; stir as required during application. Do not stir surface film into material. Remove film and, if necessary, strain material before using.

3.4 APPLICATION:

A. Apply paint in accordance with manufacturer's directions. Use applicators and techniques best suited for substrate and type of material being applied.

B. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions detrimental to formation of a durable paint film.
   1. Provide finish coats that are compatible with primers used.
   2. Apply additional coats when undercoats, stains, or other conditions show through final coat of paint until paint film is of uniform finish, color, and appearance. Give special attention to ensure that surfaces, including edges, corners, crevices, welds, and exposed fasteners, receive a dry film thickness equivalent to that of flat surfaces.
   3. Paint wall surfaces behind removed millwork and equipment.
   4. Paint interior surfaces of ducts, where visible through registers or grilles, with a flat, nonspecular black paint.
   5. Paint back sides of access panels and removable or hinged covers to match exposed surfaces.
   6. Sand lightly between each succeeding enamel or varnish coat.
   7. Omit primer on metal surfaces that have been shop-primed and touch up painted.

C. Scheduling Painting: Apply first coat to surfaces that have been cleaned, pretreated, or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.
   1. Allow sufficient time between successive coats to permit proper drying. Do not recoat until paint has dried to where it feels firm, and does not deform or feel sticky under moderate thumb pressure and where application of another coat of paint does not cause lifting or loss of adhesion of the undercoat.

D. Minimum Coating Thickness: Apply materials at not less than the manufacturer's recommended spreading rate. Provide a total dry film thickness of the entire system as recommended by the manufacturer.

E. Mechanical and Electrical Work: Painting mechanical and electrical work is limited to items exposed in mechanical equipment rooms and in occupied spaces.

F. Prime Coats: Before application of finish coats, apply a prime coat of material as recommended by the manufacturer to material that is required to be painted or finished and has not been prime coated by others.

1. Recoat primed and sealed surfaces where evidence of suction spots or unsealed areas in first coat appears, to assure a finish coat with no burn through or other defects due to insufficient sealing.

G. Stipple Enamel Finish: Roll and redistribute paint to an even and fine texture. Leave no evidence of rolling such as laps, irregularity in texture, skid marks, or other surface imperfections.

H. Pigmented (Opaque) Finishes: Completely cover to provide an opaque, smooth surface of uniform finish, color, appearance, and coverage. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or other surface imperfections will not be acceptable.

I. Completed Work: Match approved samples for color, texture, and coverage. Remove, refinish, or repaint work not in compliance with specified requirements.

3.5 CLEAN-UP AND PROTECTION:

A. Cleanup: At the end of each work day, remove empty cans, rags, rubbish, and other discarded paint materials from the site.

B. Upon completion of painting, clean glass and paint-spattered surfaces. Remove spattered paint by washing and scraping, using care not to scratch or damage adjacent finished surfaces.

3.6 PROTECTION:

A. Protect other surfaces, whether to be painted or not, against damage by painting. Correct damage by cleaning, repairing or replacing, and repainting, as acceptable to Engineer.

1. Provide "wet paint" signs to protect newly painted finishes. Remove temporary protective wrappings provided by others for protection of their work after completion of painting operations.
2. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.7 INTERIOR PAINT SCHEDULE

A. General: Provide the following paint systems for the various substrates, as indicated.

B. Ferrous Metal:

1. Semigloss Enamel Finish: 2 coats over primer with total dry film thickness not less than 2.5 mils.
   a) Prime Coat: Non-Red Lead Base Primer. Prime Coat is not required on items delivered shop primed.
   b) First Coat: Interior Enamel Undercoat (FS TT-E-543).
      1] Moore: Moore's Alkyd Enamel Underbody or owner approved equal by
      2] Devoe: 8801 Velour Alkyd Enamel Undercoat.

3] Glidden: Y-4600 Series Spred Lustre Semi-Gloss Enamel.
4] Pittsburgh: 6-6 Speedhide Quick-Drying Enamel Undercoater.
5] P&L: Interior Trim Primer.
6] S-W: S-W Pro-Mar Alkyd Semi-Gloss Enamel.

c) Second Coat: Interior Semigloss Odorless Alkyd Enamel (FS TT-E-509).
1] Moore: Moore's Satin Impervo Enamel or owner approved equal by
2] Devoe: 26XX Velour Alkyd Semi-Gloss Enamel
3] Glidden: Y-4600 Line Spred Lustre Semi-Gloss Enamel
4] Pittsburgh: 27-109 Wall-Hide Semi-Gloss Enamel.
5] P&L: Pro-Hide Plus Alkyd Semi-Gloss Enamel.
6] S-W: S-W Pro-Mar Alkyd Semi Gloss Enamel

C. Zinc-Coated Metal:
1) Semigloss Finish: 2 coats over primer, with total dry film thickness not less than 2.5 mils.
a) Prime Coat: Galvanized Metal Primer (FS TT-P- 641).
1] Moore: Moore's Iron-Clad Galvanized Metal Primer
2] Devoe: 14100 Zinc Dust Primer
3] Glidden: Y-5229-Glid Guard All Purpose Metal Primer
4] Pittsburgh: 6-215/6-216 Speedhide Galvanized Steel Paint Zinc Dust.
5] S-W: S-W Galvanized Iron Primer.

b) Second Coat: Interior Enamel Undercoat (FS TT-E-543).
1] Moore: Moore's Alkyd Enamel Underbody or owner approved equal by
2] Devoe: 8801 Velour Alkyd Enamel Undercoat.
3] Glidden: Y-4600 Series Spred Lustre Semi-Gloss Enamel.
4] Pittsburgh: 6-6 Speedhide Quick-Drying Enamel Undercoater.
5] S-W: S-W Pro-Mar Alkyd Semi-Gloss Enamel.

c) Third Coat or Fourth Coat: Odorless Interior Alkyd Semi-Gloss Enamel (FS-TT-P-509)
1] Moore: Moore's Satin Impervo Enamel or owner approved equal by.
2] Devoe: 26XX Velour Alkyd Semi-Gloss Enamel
3] Glidden: Y-4600 Line Spred Lustre Semi-Gloss Enamel
4] Pittsburgh: 27-109 Wall-Hide Semi-Gloss Enamel.
5] S-W: S-W Pro-Mar Alkyd Semi Gloss Enamel

END OF SECTION 09900

SECTION 09923 - PAINTED INTERIOR GYPSUM BOARD

PART 1 GENERAL

1.1 SCOPE

A. Includes But Not Limited To
   1. Preparing, priming, and finish painting new interior gypsum board surfaces as required by the removal and replacement of piping new and existing.

PART 2 PRODUCTS

2.1 MATERIALS

A. Primers
   1. Existing Latex Painted Surfaces -
      a) Benjamin Moore - 284 Moorcraft SuperHide Interior Latex Primer / Undercoater
      b) ICI Paints -
         1) ICI Dulux - 1030-XXXX Ultra-Hide PVA Primer / Sealer
         2) ICI Devoe - DR50801 Interior Vinyl Latex Primer / Sealer
         3) ICI Fuller O'Brien - FOB220-20 Pro-Tech Interior Latex Wall Primer
      c) PPG Paints -
         1) PPG Pittsburgh Paints - 17-21 Seal-Grip Stain Blocker Primer
         2) PPG Porter - 36642 Hi-Hide Primer / Sealer
      d) Pratt & Lambert - Suprime 1
      e) Sherwin-Williams - ProMar 200 Latex Primer B28 W200
      f) Wm. Zinsser - Bulls Eye 1-2-3 Primer / Sealer Stain-Killer
   2. New Unpainted Surfaces -
      a) New Painted Surfaces -
         1) Benjamin Moore - Latex Quick Dry Prime Seal 201
         2) ICI Dulux Paints - 1030-XXXX Ultra-Hide PVA Primer / Sealer
         3) PPG Paints -
            a] PPG Pittsburgh Paints - 6-2 SpeedHide Quick Dry Primer
            b] PPG Porter - 33642 Hi-Hide Primer / Sealer
         4) Pratt & Lambert - Suprime 4
         5) Sherwin-Williams - ProMar 200 Latex Primer B28 W200

B. Finish Coats
   1. Walls -
      a) Benjamin Moore - Two Coats Moorcraft Waterborne Acrylic Epoxy 278
      b) ICI Paints -
         1) ICI Dulux -

a] First Coat - 3210-xxxx Aquacrylic Gripper Primer / Sealer
b] Second Coat - Truglaze WB Epoxy Semi-Gloss

2) ICI Devoe -
a] First Coat - Guard Cote W / B Waterborne Epoxy Primer
b] Second Coat - Guard Cote W / B Waterborne Epoxy Gloss Coating

3) ICI Fuller O'Brien -
a] First Coat - Guard Cote W / B Waterborne Epoxy Primer
b] Second Coat - Guard Cote W / B Waterborne Epoxy Gloss Coating

c) PPG Paints -
1) PPG Pittsburgh Paint - Two Coats 98-Line Aquapon WB, Waterborne Epoxy
2) PPG Porter - Two Coats 9371 Dura-Glaze Waterborne Gloss Epoxy

d) Pratt & Lambert -
1) First Coat - Pratt & Lambert Suprime 4
2) Second Coat - Pratt & Lambert Water Borne Epoxy

e) Sherwin-Williams -
a) First Coat - ProMar 200 Latex Primer, B28 W200
b) Second Coat - Water Based Catalyzed Epoxy B70 Series/B60V25 Hardener

PART 3 EXECUTION

3.1 APPLICATION

A. General - See appropriate paragraphs of Section 09900.
B. New Surfaces
1. Primer -
a) Apply primer to be covered with other paint coats with roller only, or with spray gun and back-rolled.

END OF SECTION 09923

DIVISION 15
MECHANICAL SPECIFICATION

15000 GENERAL

15010 GENERAL REQUIREMENTS

15050 BASIC MATERIAL AND METHODS

15051 BASIC MATERIALS AN METHODS GENERAL REQUIREMENTS
15075 PIPE AND EQUIPMENT IDENTIFICATION

15080 MECHANICAL INSULATION

15083 CULINARY WATER PIPE INSULATION

15100 BUILDING SERVICES PIPING

15101 PIPE AND PIPE FITTINGS
15140 HOT AND COLD WATER SYSTEMS

15400 PLUMBING FIXTURES AND EQUIPMENT

15410 PLUMBING FIXTURES AND TRIM
15416 DRINKING WATER COOLING SYSTEM
15484 ELECTRIC WATER HEATER

SECTION 15010 - GENERAL REQUIREMENTS

PART 1 - GENERAL

1.1 GENERAL:

A. General Conditions and Division 01 apply to this Division.

1.2 SCOPE:

A. Includes -
   1. Furnish all labor, materials, and equipment necessary for completion of the mechanical work for the Department of Natural Resources Administration Building Water Supply Network Replacement, Salt Lake City, Utah.
   2. Placing the new culinary hot and cold water systems into full operation.
   3. The satisfactory performance of the completed systems is a requirement of this specification.

1.3 SITE INSPECTION:

A. The Contractor shall examine the site and understand the conditions which may affect the performance of work of this Division before submitting proposals for this work.
B. No subsequent allowance for time or money will be considered for any consequence related to failure to examine existing site conditions.

1.4 DRAWINGS:

A. Plumbing drawings show general arrangement of piping, equipment, etc; however, locations are to be regarded as shown diagrammatically only. Follow as closely as actual building construction and work of other trades will permit.
B. Because of the small scale of plumbing drawings, it is not possible to indicate all offsets, fittings, and accessories which may be required. Investigate existing structural and finished conditions affecting this work and arrange work accordingly, providing such fittings, valves, and accessories required to meet conditions.
C. If changes in location of piping, equipment, etc. are required due to lack of coordination of work under this division, such changes shall be made without charge. Contractor shall review drawings with local and state agencies having jurisdiction and any changes required by them shall be brought to the attention of the Engineer prior to bidding or commencement of work.

1.5 CODE REQUIREMENTS, FEES, AND PERMITS:

A. The work shall be installed in accordance with the following applicable codes,

ordinances and standards unless otherwise specified. The codes and standards shall include but not be limited to and be of the latest and current editions.

1. American National Standards Institute (ANSI)
2. American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE)
3. American Society of Mechanical Engineers (ASME)
4. American Society of Testing Materials (ASTM)
5. American Standards Association (ASA)
6. National Electrical Code (NEC)
7. National Fire Protection Association (NFPA)
8. Underwriters Laboratories (UL)
9. International Building Code (IBC) 2003 ed
10. International Mechanical Code (IMC) 2003 ed
11. International Plumbing Code (IPC) with Utah Amendments 2003 ed
12. Utah State Safety Orders (OSHA/UOSH)
13. Utah Fire Rating Bureau
14. Utah Boiler and Pressure Vessel Law
15. Utah Air Conservation Regulations/Waste Disposal regulations.
16. Energy Code for Commercial and High Rise Building ASHRAE/IES NA 90.1-2001.

B. Should drawings conflict with any code, the code shall govern. If drawings and specifications establish a quality exceeding the code, the drawings and specifications shall govern. If conflicts do exist among the drawings, specifications and codes, the same shall be brought to the attention of the Engineer in writing prior to bidding, otherwise Contractor shall comply with applicable codes.

C. The latest edition of all codes shall be used.

D. Contractor shall give all notices, obtain all necessary permits, file necessary plans, prepare documents and obtain approvals, and pay all fees required for completion of the plumbing work outlined in this Division of the specifications and shown on the Plumbing Drawings.

1.7 OPERATION AND MAINTENANCE INSTRUCTIONS:

A. Contractor shall instruct building maintenance personnel in the operation and maintenance of the installed water heater and water systems.

B. Minimum instruction period shall be one to two hours or until Owner is satisfied.

C. Instruction periods shall occur before final inspection and before final payment is made.

1.8 RECORD DRAWINGS:

A. Contractor shall keep an up-to-date set of plumbing drawings in his custody showing all changes in red, clearly defined and neatly drafted by him. At the end of construction, he shall turn these drawings over to the Engineer. Record drawings must be completed and submitted prior to final inspection.

PART 2 - PRODUCTS
(Not Used)

PART 3 - EXECUTION
(Not Used)

END OF SECTION 15010

SECTION 15051 - BASIC MATERIALS & METHODS GENERAL REQUIREMENTS

PART 1 - GENERAL

1.1 GENERAL:

A. Division 15010 General applies to this Section.

1.2 COORDINATION OF WORK:

A. It is understood that while Drawings are to be followed as closely as circumstances permit, this Division will be held responsible for the installation of the new culinary hot and cold water systems according to the true intent and meaning of the Contract Documents. Anything not clear or in conflict will be explained by making application to the Engineer in writing. Should conditions arise where certain changes would be advisable, secure Owner's and Engineer approval for these changes before proceeding with work.

B. Coordinate new work with the existing conditions in installing interrelated work. Before installation of the new piping, make proper provision to avoid existing interferences.

C. Arrange piping and equipment to permit ready access to valves, unions, and to clear openings of doors and access panels. Contractor shall provide all necessary access doors and/or panels to provide complete access to all piping, valves or accessories. Doors for plumbing piping and equipment access shall be minimum 24" x 24".

D. Furnish and install supports required by Division 15 unless otherwise noted. Furnish supports, and equipment that are an integral part of other Divisions involved in sufficient time to be built into the construction as the work proceeds. Locate these items and see that they are properly installed. Expense resulting from improper location or installation of items above shall be borne by Contractor.

E. Be responsible for required cutting, and patching incident to work of this Division and make required repairs afterwards to satisfaction of Owner and Engineer. Cut carefully to minimize necessity for repairs to existing work. Do not cut beams, columns, or trusses.

1. Patch and repair walls, and floors with materials of same quality and appearance as adjacent surfaces unless otherwise shown.
2. This Division shall bear expense of cutting, patching and repairing of work because of damage done by it.

F. Adjust locations of piping, equipment, etc, to accommodate work from interferences anticipated and encountered. Determine exact route and location of each pipe and cut prior to fabrication.

1. Make offsets, transitions, and changes in direction of piping as required to maintain proper head room and pitch of sloping lines whether or not indicated on Drawings.

G. Slots and openings through floors and walls shall be provided by this Division.

Use existing openings where possible.

H. This Contractor shall schedule his work, store his equipment and materials, and work in harmony with the Owner so as to not delay or jeopardize the construction.

1.3 EQUIPMENT & MATERIALS:

A. Requests for substitution shall be received in writing a minimum of seven days prior to bidding. Prior acceptance shall be by Manufacturer's name only. Items not listed in this specification or subsequent addendums shall not be considered. No oral approvals will be acceptable. Manufacturers listed in this specification are acceptable only for items listed. All other items manufacturer wishes to bid must be prior approved. All equipment shall be subject to final review in accordance with "Project Submittals".

B. Product Approvals -
   1. If approval is received to use other than specified items, responsibility for specified capacities and insuring that items to be furnished will fit space available lies with this Division.
   2. In the event other than specified equipment is used and will not fit job site conditions, this Division assumes responsibility for replacement with items named in Specification.

C. Use domestic made pipe and pipe fittings on Project.

D. Equipment name plates as well as applicable UL labels shall be in place when Project is turned over to Owner.

E. Insure that items to be furnished fit spaces available. Make necessary field measurements to ascertain space requirements including those for connections and furnish and install equipment of size and shape so final installation shall suit true intent and meaning of Contract Documents. Do not scale off drawings.

F. All materials shall be of the best commercial quality obtainable, consistent with specified materials and for the purpose or function intended. Materials shall be new.

G. Equipment catalog or model numbers shown define the basic equipment types and quality standard only. Catalog numbers shall not be considered as all inclusive and shall be verified to include all devices, controls, operators, and appurtenances necessary for the satisfactory and complete operation of the equipment.

H. Follow manufacturer's directions in delivery, storage, protection, and installation of equipment and materials.
   1. Promptly notify Engineer in writing of conflicts between requirements of Contract Documents and Manufacturer's directions and obtain Engineer’s written instructions before proceeding with work. Contractor shall bear all expenses arising from correcting deficiencies of work that does not comply with Manufacturer's directions or such written instructions from Engineer.

I. Deliver equipment and material to site and tightly cover and protect against dirt, water, and chemical or mechanical injury but have readily accessible for inspection. Store items subject to moisture damage in a dry, heated space.

1.4 PROJECT SUBMITTALS:

A. Furnish complete catalog data for manufactured items of equipment to be used in the Work to Engineer for review within 10 days after award of Contract.

B. Submittal shall include, but not be limited to the following:
   1. equipment scheduled
   2. insulation
   3. certificates of guarantee
   4. valves
   5. plumbing piping, accessories, and specialties

C. Submit a minimum of five copies of data in binders and index in same order and name as they appear in Specification.
   1. State sizes, capacities, brand names, electrical requirements, accessories, materials, gauges, dimensions, and other pertinent information.
   2. List on catalog covers page numbers of submitted items.
   3. Underline or highlight applicable data.

D. If material or equipment is not as specified or submittal is not complete, it will be rejected.

E. Catalog data or shop drawings for equipment which are noted as being reviewed by Engineer shall not supercede Contract Documents.

F. Review comments of Engineer shall not relieve this Division from responsibility for deviations from Contract Documents unless Engineer’s attention has been called to such deviations in writing at time of submission, nor shall they relieve this Division from responsibility for errors in items submitted.

G. Check work described by catalog data with Contract Documents for deviations and errors.

H. All items other than first named specified equipment shall show and state all exceptions and deviations taken and shall include design calculations and drawing layouts.

I. The Contractor shall review the submittals prior to submission to the Engineer to make sure that the submittals are complete in all details. No submittal will be reviewed which does not bear the contractor's notation that such checking has been made.

J. No partial submittals will be considered unless approved by the Engineer.

K. Manufacturers' names shall be mentioned as acceptable prior to bidding.

L. Contractor shall verify equipment dimensions to fit the spaces provided with sufficient clearance for servicing the equipment.

M. Contractor shall review equipment submittals for compliance with schedules, specifications, and drawing plans and details. Equipment submittal shall show the proper arrangements to suit installation and maintenance such as piping connections, etc.

N. Equipment submittal sheets shall be clearly marked indicating equipment symbol and exact selection of proposed equipment. Submittals shall clearly indicate name of manufacturer of each item.

O. For unacceptable items, the right shall be reserved to require the first named

specified items.

P. Where submittals are sent to Engineer with any of the above listed information missing or are incomplete they will be returned to the contractor unchecked to be completed and resubmitted. No additional time or money shall be allowed for failure to provide complete submittals on the first review.

Q. If an item requiring submittal review is ordered, purchased, shipped, or installed prior to the submittal review and is subsequently disapproved the item shall be removed from the job site and replaced with an approved item at contractors expense.

1.5 CLEANING & FINISHING:

A. Contractor shall, at all times, keep the premises free from waste material and rubbish. Upon completion of this Section of the work, Contractor shall remove all surplus materials and rubbish; clean all spots resulting from the mechanical work from hardware, floors, glass, walls, etc.; do all required patching up and repair all work of other trades damaged by Contractor under this Section of the work, and leave the premises in a clean orderly condition. Remove rust, plaster, dirt, grease and oil before painting, insulating, or exposing to view the equipment, piping, etc. in completed structure. Refinish any damaged surfaces and leave in proper working order at final completion.

1.6 SUPERVISION:

A. The Contractor shall supervise and direct the work with his best skill and attention. He will be solely responsible for the means, methods, techniques, sequences and procedures of construction. The Contractor will be responsible to see that the finished work complies accurately with the Contract Documents.

1.7 SAFETY REGULATIONS:

A. Contractor shall provide equipment, supervision, construction, procedures, and everything necessary to assure safety of life or property.

B. Refer also to General Condition and Special Conditions for protection clauses.

1.8 LEAK DAMAGE:

A. Contractor shall be responsible for damages to the work or to the building, or to its contents, people, etc., caused by leaks in any of the equipment or piping installed by him through equipment or material failures, leaking joints or disconnected pipes, fittings, or by overflows and shall make at his own expense all repairs to fixtures, building interior, contents, paint, rugs, furniture, ceiling tile, and equipment so damaged.

1.9 TOOLS AND STORAGE OF EQUIPMENT:

A. The Contractor shall furnish all necessary tools, staging and whatever may be necessary for the installation of this work and shall at all times protect this work and others, and the materials to be used therein from damage by the weather, accident and other causes, and shall repair and make good any damage thus occurring.

1.10 WORKMANSHIP:

A. Workmanship shall be the best quality of its kind for respective industries, trades, crafts and practices and shall be acceptable in every respect to the Owner and Engineer. Nothing contained herein shall relieve the Contractor from performing good work, perfect in all details of construction.

1.11 PAINTING BY CONTRACTOR:

A. See section 09900 for painting requirements.
B. Painting shall be by persons experienced in painting.
C. All equipment, metal stands and supports shall be painted as follows:
   1. The prime coat on equipment shall be factory applied. The finish coats shall be applied under Section 09900 of these specifications.

1.12 ELECTRICAL WORK:

A. Power wiring to the electric hot water heater shall be done under a design build Electrical Contractor hired by this Contractor.
B. The design build Electrical Contractor shall furnish and install all required new electrical materials including properly sized heaters, and disconnect switches as required by code.

1.13 INSPECTION NOTICE:

A. The following is a basic list of guideline items so that the Engineer and Owner's representative can be at job site for these inspections as the building progresses. Mechanical Contractor shall inform these people one week in advance of test time.
   1. Pressure tests on all water service piping.
   2. Any changes or problems occurring at job site.
   3. Periodic inspection at their discretion will be made to insure compliance to Contract Documents and codes. Contractor shall provide ladders, access and other assistance as requested during inspections.
   4. Final inspection before giving approval for final payment.

1.14 WARRANTY GUARANTEE:

A. The Contractor shall warrant all materials and equipment to be of quality consistent with specifications as represented by manufacturer's published data.

B. The Contractor shall guarantee that the installation and operation of the equipment shall be free from defects for a period of one year beginning at date of substantial completion and acceptance. The Contractor shall replace or repair any part of the installation that is found to be defective or incomplete within the guarantee period.

C. The one year guarantee on equipment and systems shall commence when equipment has been demonstrated to work and has been accepted. (Example: If an equipment item fails to perform and it takes 9 months after substantial completion to correct, then the guarantee shall commence after the item has been demonstrated to perform and has been accepted.)

D. Substantial completion and acceptance in no way relieves the Contractor from providing the systems and equipment as specified.

1.15 COMPLETION SCHEDULE:

A. Verification of basic equipment items shall be done prior to the date of substantial completion with sufficient time to allow adjusting.

B. At the time of the final inspection a date shall be agreed upon for completion of any remaining items. At least double the estimated cost of the work will be withheld from the Contractor's payment.

PART 2 - PRODUCTS

(Not Used)

PART 3 - EXECUTION

(Not Used)

END OF SECTION 15051

SECTION 15075 - PIPE AND EQUIPMENT IDENTIFICATION

PART 1 - GENERAL

1.1 SCOPE:

A. Piping Identification
   1. All new culinary hot and cold water piping shall be labeled and color coded with contents clearly identified and arrows indicating direction of flow. This applies to piping run above the ceilings, as well as pipe exposed in the equipment rooms and finished areas. Pipes shall be identified at the following locations:
      a. Adjacent to each valve.
      b. At every point of entry and exit where piping passes through a wall or floor.
      c. On each riser and junction except where exposed in finished areas.
      d. A maximum of every 50 feet on long continuous lines fully exposed to view. Less spacing if one cannot see one code from the adjacent.
      e. Adjacent to all special fittings or devices (regulating valves, etc..
      f. Connection to equipment.

PART 2 - MATERIALS

2.1 PIPING IDENTIFICATION:

A. Labels and markers shall be of the self-sticking, all-temperature permanent type as manufactured by W. H. Brady Co., 727 West Glendale Ave., Milwaukee, Wisconsin; or Seton Name Plate Corp., 592 Boulevard, New Haven, Connecticut.
B. Pipe color coding shall be uniform throughout the building and comply with requirements of ANSI A13.1.
C. All paint to be Enamel, Moore Impervo and Iron Clad.
D. Letters of identification legend and directional flow arrows shall be 2" high for pipes 3" and larger, and 1" high for pipes 2-1/2" and under.
E. Proposed identification system shall be approved by Owner and Engineer prior to installation.

PART 3 - EXECUTION

3.1 PIPING IDENTIFICATION:

A. Markers shall be installed in strict accordance with manufacturer's instructions. Use vinyl tape first and stick markers over tape. This procedure assures that the tape will not fall off.
B. On chalky and loose insulation, soft, porous, fiber-filled or fiberglass covering, a

spiral wrap of pipe banding tape shall be made around the circumference of the pipe. Sufficient spiral wraps shall be made to accommodate the horizontal dimension of the pipe marker.

C. On bare pipes, painted pipes, and pipes insulated with a firm covering pipe banding tape matching the background color of the marker shall be used. After applying pipe markers, wrap pipe banding tape around pipe at each end of marker. Tape should cover 1/4" to 1/2" to 1" on itself. Be sure pipe surface is dry and free of dirt or grease before applying markers or banding tape.

D. Stenciling may be used in lieu of the above labels and markers if finished application gives the same overall appearance, that is that stenciling is applied over a background color. If stenciling, is used, letter heights, background colors, banding and arrows shall be as specified above. Submit sample to Owner before proceeding with work.

E. Apply markers so they can be read from floor.

END OF SECTION 15075

SECTION 15083 - CULINARY WATER PIPE INSULATION

PART 1 - GENERAL

1.1 SCOPE:

A. Includes -
   1. Insulating of all culinary hot and cold water piping and fittings.
   2. The insulation products used on the project shall be of one manufacturer. All pipe insulation shall meet the requirements of IBC.
   3. Insulation products on this project shall be installed by a licensed insulation contractor using materials, and methods described in this section. Installation by other than an experienced licensed contractor shall not be acceptable.

PART 2 - PRODUCTS

2.1 INSULATION:

A. Snap-on glass fiber pipe insulation with surface burning characteristics as determined by ASTM E84 with a flame spread rating not to exceed 25 and smoke developed not to exceed 50.
B. Snap-on glass fiber pipe insulation. Heavy density pipe insulation with a factory applied ASJ vapor barrier jacket.
C. Approved Manufacturers:
   1. Owens-Corning
   2. Johns-Manville
   3. Knauf
D. Thickness shall be as noted in Table 1.

2.2 COVERING:

A. Where piping insulation is exposed to public view, stairwells, susceptible to damage, or routed below 6'0" above finished floor provide with pre-finished PVC jacket.
   1. Jacket material shall be a standard weight and shall be smooth. Jacket shall be pre-finished with color selected by the owner’s representative.

PART 3 - EXECUTION

3.1 PIPING:

A. General
   1. Pipe insulation shall be continuous through the sleeve.
   2. An aluminum jacket shall be provided over the insulation wherever caulking is required.

3. Insulation shall be continuous through hangers.
4. Support points such as hangers shall have a calcium silicate support block as furnished by insulation manufacturer.

B. Cold Lines
1. Insulation shall be applied to clean, dry pipe with joints tightly butted and the ends of the insulation sealed off with vapor barrier coating at intervals not to exceed 15 feet.
2. Longitudinal laps of the jacket material shall overlap not less than 1-1/2 inches. Butt strips 3 inches wide shall be provided for circumferential joints.
3. All laps and butt strips shall be secured with adhesive and stapled on 4-inch centers.
4. Staples and seams, including those on self-sealing lap systems shall be coated with a vapor barrier coating.
5. Breaks and punctures in the jacket material shall be patched by wrapping a strip of jacket material around the pipe and securing it with adhesive, stapling, and coating as specified for butt strips. The patch shall extend not less than 1-1/2 inches past the break.
6. At penetrations such as thermometers, the void in the insulation shall be filled with vapor barrier coating and the penetration shall be sealed with a brush coat of the same coating.

C. Hot Lines
1. Insulation shall be applied to clean, dry pipe with joints tightly butted.
2. Longitudinal laps of the jacket material shall overlap not less than 1-1/2 inches, and butt strips 3 inches wide shall be provided for circumferential joints.
3. Laps and butt strips shall be secured with adhesive and stapled on 4-inch centers. Adhesive may be omitted where pipe is concealed.
4. Breaks and punctures in the jacket material shall be patched by wrapping a strip of jacket material around the pipe and cementing, stapling, and coating as noted for butt strips. Patch shall extend not less than 1-1/2 inches past the break.
5. The run of the line pipe insulation shall have the ends brought up to the item.
6. Penetrations such as thermometers, pressure gauges etc., the void in the insulation shall be filled with vapor barrier coating and the penetration shall be sealed with a brush coat of the same coating.

3.2 FITTINGS:

A. Insulate fittings with same type and thickness of insulation as pipe, with ends of insulation tucked snugly into throat of fitting and edges adjacent to pipe insulation tufted and tucked in or tapered.

B. Cover insulation with one piece "Zeston" type PVC fitting cover or equal by Ceel Co.secured by stapling or taping ends to adjacent pipe covering.

C. Alternate Method -
1. Insulate fittings with one inch of insulating cement and vapor seal with two

1/8 inch wet coats of vapor barrier mastic reinforced with glass fabric extending two inches onto adjacent insulation.

TABLE 1
Pipe Insulation Thickness

PIPE SYSTEM	PIPE SIZE		
	LESS THAN 1"	1" TO 1-1/4"	1-1/2" TO 4"
HOT WATER	1/2"	1/2"	1"
COLD WATER	1/2"	1/2"	1"

END OF SECTION 15083

SECTION 15101 - PIPE AND PIPE FITTINGS

PART 1 - GENERAL

1.1 RELATED SECTIONS:

A. Division 15010 General applies to this Section.

1.2 SCOPE:

A. Includes -
   1. General piping installation, materials and procedures for all piping systems.

B. Related Work Specified Elsewhere -
   1. Type of pipe and fittings for culinary water shall be specified in that particular Section.

PART 2 - PRODUCTS

2.1 HANGERS:

A. Provide one of the following types of hangers for horizontal piping. Comparable products of Grinnell, Globe Pipehanger, B-Line, Michigan Hanger, Superstrut or Piping Technology and Products (PTP) considered equal.

B. Except as otherwise specified hereinafter: Clevis type, B-Line Fig. B3100.

C. Where pipe exceeds maximum loading recommended for Clevis type Hangers, provide steel pipe clamp, B-Line Fig. B3140 or Fig. B3142, depending on loading.

D. Provide trapeze hangers where several pipes can be installed parallel and at the same level. Trapeze hangers shall consist of 2 steel channels bolted back to back spaced for rod hangers at each end.

E. Supporting rods shall be attached to existing joists.

F. Supporting rods over 18 inches long shall be braced at every fourth hanger with diagonal bracing attached to beam.

G. For copper tubing use copper hanger; or dielectrically isolate.

2.2 FLOOR SUPPORTS:

A. Provide one of the following means of supporting horizontal piping from floor:

B. Pipe Saddle Support, B-Line, Fig. B3095 with pipe nipples to suit. Fasten to floor.

2.3 WALL SUPPORTS:

A. Provide one of the following means of supporting horizontal piping from wall:

B. B-Line B-200 pipe clamp.

C. For hanger suspension, 750 pound maximum loading, light welded steel bracket with hole for one rod, 3/4 inch diameter. B-Line Fig. B3068.

2.4 VERTICAL PIPING SUPPORTS:

A. Vertical pipe supports shall be steel extension pipe clamps, B-Line Fig. B3373 or Fig. B3131, refer to manufacturer's rated maximum loading for each size pipe. Bolt clamp securely to pipe, rest clamp-end extension on building structure.
B. Where pipe sleeves extend above floor, place pipe clamps at ceiling below, support clamp-end extension from inserts.

2.5 CLAMPS:

A. Beam clamps shall be malleable iron, B-Line Fig. B442 for 1/4 inch hanger rods; forged steel beam clamp, B-Line B321 for hanger rod up to 1-1/2 inches.

2.6 PIPE COVERING PROTECTION:

A. Provide calcium silicate blocks in the bottom 1/2 diameter of pipe to protect insulation at areas of contact with hangers and supports. Material shall be 8 inches long for pipes up to 3 inches.

2.7 WALL AND CEILING PLATES:

A. Fit pipes passing through walls, floors, and ceiling with wall plates of proper size to cover openings around pipes. Plates will not be required at floor slabs where sleeves project above floor and space between pipe and sleeve is caulked and sealed. Plates shall be equal to Beaton and Cadwell No. 10, pressed steel plates. Floor plates shall be chromium plated. Wall and ceiling plates shall be prime coated.

2.8 UNIONS AND COUPLINGS:

A. Unions: Malleable iron, brass to iron seat, ground joint, same materials as pipe. Crane, Walworth, or approved equal.
B. Dielectric Unions: Mechanical Contractor shall install dielectric union or couplings whenever copper pipe connects to steel pipe or other items of equipment. Couplings and unions shall be as manufactured by the Water Vallot Company of Detroit, Michigan, or approved equal. Union shall be installed in an accessible location.

2.9 PIPING SPECIALTIES:

A. Provide thermometers, pressure gages, vents, tank fittings, and other miscellaneous piping specialties as shown or as may be required by usual good practices for a complete system.
B. Thermometers shall be 9" scale, red reading, glass covered, immersion type with separable sockets. Marshall-Town, Trerice, Weskler, or Weiss, with neck extension to accommodate insulation.

C. Pressure gages shall be 4-1/2" diameter dial, liquid filled, molded case dust proof, phosphor bronze, bourdon tube type installed with integral check screw or pressure snubber. Marshalltown, U.S., Ashcroft, Trerice or Marsh.

2.10 STRAINERS:

A. Walworth 3699 - 1/2 Sarco SB; bronze, smaller than 2-1/2 inches. Bailey 125 pound No. 100; Zurn 125 pound No. 540 FPS; or Crane No. 989-1/2, cast iron 2-1/2 inches and larger. Water straining element shall be perforated 20 mesh monel screen. Strainers shall be designed for the same working pressure as the control valves. Provide strainer blowoff port with line size hose bibb and vacuum breakers.

2.11 VALVES:

A. Provide on each valve a name plate showing manufacturer, valve size, grade, and pressure temperature service rating.
B. See specific piping system sections for valves to be used in that system.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Furnish and install a complete system of culinary hot and cold water piping, valved as indicated or as necessary to completely control entire apparatus. Pipe drawings are diagrammatic and indicate general location and connections. Piping may have to be offset, lowered, or raised as required or directed at site. This does not relieve this Division from responsibility for proper erection of systems of piping in every respect.
B. Properly support piping and make adequate provision for expansion, contraction, slope, and anchorage.
    1. Cut piping accurately for fabrication to measurements established at site and work into place without springing or forcing.
    2. Do not use pipe hooks, chains, or perforated metal for pipe support.
    3. Remove burr and cutting slag from pipes.
C. Piping shall not interfere with removal of existing equipment, ducts, or devices, or block access to doors, windows, or access openings. Provide accessible, ground joint unions in piping at connections to equipment.
D. Make connections of dissimilar metals with insulating couplings.
E. Provide sleeves around pipes passing through floors, walls, partitions, or structural members.
    1. Seal sleeves with plastic or other acceptable material.
    2. All piping passing through floors shall have a water tight sleeve and water tight caulking around pipe. Extend pipe sleeve minimum of 3 inch above floor.
F. Cap or plug open ends of pipes and equipment to keep dirt and other foreign

materials out of systems. Do not use plugs of rags, wool, cotton waste, or similar materials.

G. Install piping systems so they may be easily drained.

H. Valves of same type shall be of same Manufacturer.

I. Do not use reducing bushings, street elbows, or close nipples.

J. Make changes in direction with proper fittings. Bending of pipe is not approved.

K. Hanger rods shall be of a diameter adequate to support pipe size.

L. Install additional supports as required.

M. Suspend all piping in building except that underground. Laying of piping on any building member is not allowed.

N. Design all hangers to support the required loads. Where necessary, supports shall be designed to permit movement due to expansion and contraction. Where drawings show details of supports and anchors, conform to details shown. Where details are not shown, conform to General Requirements specified in sub-paragraph.

O. Horizontal Piping Support Schedule: Support horizontal piping of steel and copper as follows:

HORIZONTAL PIPING SUPPORT SCHEDULE

Pipe Size	Rod Diameter	Maximum Spacing
Up to 1-1/4"	3/8"	6'-0"
1-1/2" and 2"	3/8"	10'-0"
2-1/2" and 3"	1/2"	10'-0"

P. Support horizontal lines of copper tubing with hangers. Space not more than 8 feet center to center.

Q. Cutting or other weakening of the building structure to facilitate installation will not be permitted. The Contractor shall demonstrate that no weight or stress is placed upon the equipment by the piping and that piping and connection of equipment are in perfect alignment. When so directed, disconnection and reconnection of piping shall be done by Contractor for designated pipe section to properly demonstrate stress; this shall be at no cost to Owner.

R. Unions shall be provided in the piping at connections to hot water heater. All piping shall be installed to insure noiseless circulation. All valves and specialties shall be placed, packed and adjusted at the completion of the work before final acceptance.

S. Operating Valves shall be accessible for operation from floors or platforms where feasible, and handwheels shall not be more than 4'-6" above the floor or platform. In other cases, valves and cocks shall be equipped with chain operated handwheels or extension stems, or other suitable means of remote control.

1. Tighten glands and add additional gland packing as required before final

inspection.

T. Provide sufficient clearance for insulated piping and fittings to permit application of insulation without cutting either pipe line covering or fitting coverings.

3.2 PIPE PROTECTION:

A. Do not run piping in outside wall, or where freezing may occur. Piping in attic spaces shall be run on the interior side of building insulation.

B. No water piping in building shall be in contact with earth.

C. All piping as installed shall be plugged or capped until equipment has been permanently connected.

3.3 GRADE AND DRAINAGE:

A. Domestic hot and cold water lines shall be graded so as to drain system with as few drains as possible. Drains shall be located in convenient and accessible places. All drainage piping shall extend to floor drains.

3.4 CROSS CONNECTIONS:

A. No plumbing fixture, device or piping shall be installed which will provide a cross-connection or interconnection between a distributing water supply for drinking or domestic purposes and polluted source.

B. Provide all hose bibbs and equipped with a hose connection with a vacuum breaker.

3.5 DIELECTRIC FITTINGS:

A. Shall be used to connect dissimilar metals (such as steel and copper) to prevent electrolytic action.

3.6 PIPE JOINTING:

A. All copper pipe shall be joined by soldering or screwed connections. The mitering of pipes to form elbows and the notching of straight runs to form tees will not be allowed. All piping shall be cut to length by hack-saw or pipe cutter. Cutting of pipe with a torch will not be allowed.

B. Threaded Piping:

1. Threading shall be American-Standard taper pipe threads. Ream pipe ends and remove burrs after threading. Limit number of threads so that not more than two (2) threads will show beyond fitting.
2. All pipe joints shall be properly sealed with thread coatings applied to the male thread. Sealer for culinary water piping shall be Teflon tape

C. Soldered Piping:

1. Tubing shall be cut square and burrs removed. Both inside of fittings and outside of tubing shall be well cleaned with steel wool before sweating.

Care shall be taken to prevent annealing of fittings and hard drawn tubing when making connections. Joints for sweated fittings shall be made with a non-corrosive paste flux and solid wire solder. Use 95-5 or 96-4 Tin-Antimony solder. Cored solder will not be permitted.

3.7 PIPE CLEANING AND DISINFECTION:

A. All piping shall be flushed clean before connection to fixtures etc. For specification cleaning requirements see individual piping sections.

3.8 PIPE TESTING:

A. Test piping prior to painting, insulating, or concealment. Valve off or isolate fittings, equipment or other piping which may be damaged by testing pressures. Provide relief valves set to avoid bursting pressure during test.

B. Domestic water piping shall be hydrostatically tested at 100 psi or 1 ½ times working pressure of medium being conveyed in piping with less than a four percent drop in pressure over a six hour period.

END OF SECTION 15101

SECTION 15140 - HOT AND COLD WATER SYSTEMS

PART 1 - GENERAL

1.1 SCOPE:

A. Includes -
   1. Furnish and install all culinary hot and cold water piping shown on the drawings complete with necessary valves, connections, and accessories inside the building and connect into cold water service piping where shown on the drawings.
   2. All water systems shall meet the requirements of ANSI/NSF Standard 61 Section 9, concerning metal contaminants in the water system.
   3. Provide stainless steel piping or a chrome plated sleeve over copper piping for piping noted on the drawings and routed exposed in finished space.

PART 2 - PRODUCTS

2.1 PIPE AND FITTINGS:

A. Inside Building
   1. Hot and cold water service piping: Type L, copper, hard drawn with wrought copper fittings.
   2. Chrome plated piping (options)
      a. Provide a chrome plated galvanized steel pipe sleeve over copper pipe wrapped with 2 layers of Scotch 33 plastic tape. Sleeve pipe shall be one pipe size larger than copper pipe outside diameter.
      b. Pipe shall be chrome plated by a firm that is in the business of chrome plating. Chrome finish shall be a bright or show finish or
      c. Type 304 stainless steel pipe and fittings. Piping shall have a polished type finish.

2.2 VALVES:

A. Interior culinary water valves shall be ball type.
   1. Con Bra Co “Apollo”
   2. Hammond
   3. Honeywell - Braukmann
   4. Jenkins
   5. Milwaukee
   6. Nibco - Scott
   7. Stockham
   8. Watts

B. Combination pressure reducing valve and strainer.
   1. Provide on main water line as shown and detailed on the drawings.

2. Integral stainless steel strainer or separate "Y" strainer installed up stream of pressure reducing valve.
3. Built-in thermal expansion by-pass check valve.
4. Approved manufacturers.
    a. Watts U5B or equal by
    b. Cash valve
    c. Clayton valve
    d. Spencer
    e. Thrush
    f. Wilkins

2.3 VACUUM BREAKERS AND BACKFLOW PREVENTERS:

A. Backflow preventers and vacuum breakers shall be installed in water lines to provide protection against cross contamination. Such devices shall be of approved manufacture and installed in accordance with the International Plumbing Code. Provide backflow preventers for:
    1. Hose bibbs
    2. Any fixture that accommodates a hose or tubing connection (i.e. faucets, etc.)
    3. Make-up water lines to mechanical equipment
    4. Any item required by code to have same
B. Backflow preventers, vacuum breakers and completed assembly shall comply with the International Plumbing Code.

2.4 HYDRAULIC SHOCK (WATER HAMMER) CONTROLS:

A. Provide hydraulic shock controls for flush valves and water header. Shock controls shall be Smith, Zurn, Wade, or Josam.

PART 3 - EXECUTION

3.1 INSTALLATION

A. For general piping installation, see Section 15101**.**
B. Piping Inside of Building
    1. Provide valves on hot and cold water lines to each rest room for zone control of system. Provide access for all valves.
    2. Do not run piping in outside walls or ceiling space unless it is located on the building side of insulation envelope.
    3. Locate cold water piping a minimum of six inches from hot water piping.
    4. Before pipes are covered, etc. Contractor shall test the piping installation in the presence of the Engineer, and Owners Representative. Piping shall be tested as described in Section 15101.
C. Pipe Sterilization and Disinfection
    1. Sterilize the new domestic water system as described:

a. After the water system has been flushed clean, the shutoff valve to the water main shall be closed. All fixture outlets shall be opened slightly. A solution of sodium hypochlorite and clean water shall be introduced at the new tie-in to the existing water pipes downstream of new valve, until residual chlorine is detected at all water faucets, outlets, etc. The solution shall consist of 1 gallon of 5 percent sodium hypochlorite (Chlorox or Purex) to 200 gallons of water. The solution shall be flushed and all aerators and strainers shall be removed, cleaned, and replaced.

b. Contractor shall furnish to Owner and Engineer a written report certifying completion that pipe cleaning and disinfection has been completed and accepted.

2. After sterilization, flush solution from system with clean water until residual chlorine content is less than 0.2 parts per million.

3. Water system will not be accepted until a negative bacteriological test is made on water taken from system. Chlorine dosing shall be repeated as necessary until such negative test is accomplished.

4. Use the water treatment Contractor that's being used at the current time or as approved by Engineer and Owner.

END OF SECTION 15140

SECTION 15410 - PLUMBING FIXTURES AND TRIM

PART 1 - GENERAL

1.1 SCOPE

A. Division 15010 and 15051 applies to this Section.
B. All existing sinks and lavatories shall have a new shut-off valve on all water supply lines on the room side of the fixture. All valves must have a gasket seat, not a ground joint. Supply lines from the valve shall be 3/8" brass, chrome plated.
C. Interior exposed pipe, valves, and fixture trim shall be chrome plated or stainless steel.
D. Complete installation of each existing fixture with accessible stop or control valve in each hot and cold water branch supply line.
E. Polish chrome and stainless steel finish at completion of Project.
F. Install fixtures and fittings as per local codes and Manufacturer's instructions. Fixtures shall be mounted level.
G. Do not use flexible water piping.
H. All plumbing fixtures, trim and accessories in contact with the culinary water system shall comply with the requirements of ANSI/NSF 61 Section 9. Every box containing such component shall carry a notice of compliance including Testing Lavatory providing classification/certification and control number.

PART 2 - PRODUCTS

2.1 FIXTURE

A. Hose Bibb -
    1. Single faucet with vacuum breaker and female connection.
B. Approved Manufacturers
    1. Chicago
    2. Hammond
    3. Woodford

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install complete system in accordance with IPC-2003 plumbing code.

END OF SECTION 15410

SECTION 15416 - DRINKING WATER COOLING SYSTEMS

PART 1- GENERAL

1.1 SUMMARY

A. Includes But Not Limited To
   1. Furnish and install drinking water cooling system unitsas described and scheduled in Contract Documents.

PART 2- PRODUCTS

2.1 GENERAL

A. Interior exposed pipe, valves, and fixture trim shall be stainless steel or chrome plated.
B. Do not use flexible water piping.

2.2 MANUFACTURED UNITS

A. Handicap Accessible Single Fountain
   1. Vandal proof operating bar on front and both sides. 7.8 GPH minimum of 50 deg F water with 90 deg F room temperature, 1/5 horsepower compressor motor, 120 V, 60 Hz, single phase. One piece stainless steel back splash and basin. Flexi-guard or chrome plated brass bubbler.
   2. Approved Manufacturers And Models -
      a) Elkay - EBFSA-8
      b) Halsey Taylor - HAC8FS-Q
      c) Haws - HWCA-8 or HWBF-8
      d) Oasis - P8AM
      e) Sunroc - NWCA-8

PART 3- EXECUTION

3.1 INSTALLATION

A. Install new drinking fountains n same location as removed recessed drinking fountains Use stainless steel covering over wall openings.
B. Mounting
   1. Coordinate location of fountain with location and height of existing removed drinking fountain.
   2. Handicap Accessible Single Fountain -
      a) Anchor bottom of fountain to wall.
      b) Top surface to be 32 inches above floor unless required otherwise by local code. Bottom of fixture overhang to be 27 inches above floor.

c) Install 3/8 inch IPS union connection and Chicago No. 376 stop to building supply line.
d) Install 1-1/4 inch IPS slip cast brass 'P' trap. Install trap so it is concealed.
e) Finished installation will have the new DF installed without any trace of the existing removed recessed DF. All wall openings shall be covered with stainless steel panels.

3.2 CLEANING

A. Polish chrome finish at completion of Project.

END OF SECTION 15416

SECTION 15484 - ELECTRIC WATER HEATER

PART 1 GENERAL

1.1 SUMMARY

A. Includes But Not Limited To
   1. Furnish and install the electric water heater as specified in Contract Documents with size and capacity as scheduled on the Drawings.

PART 2 PRODUCTS

2.1 STANDARD WATER HEATERS ELECTRIC

A. 82 Gallon
   1. Porcelainized glass lined storage tank pressure tested and rated for 125 PSI working pressure.
   2. Water heater shall have ASME rated temperature-pressure relief valve rated at MBH input of heater minimum set to relieve at 120 psi.
   3 3 inches minimum glass fiber or polyurethane foam insulation.
   4. Complete with three stage thermostat with step control, magnesium anode, electric sheath rod type heating elements, and high limit control.
   5. Heater shall be pre-wired and entire unit bear UL label.
   6. Approved Manufacturers And Models -
      a. State Model SB6 - 82 - 18
      b. A O Smith Model DVE - 80 - 18
      c. Ruud Model EGL 85 - 18

2.3 ACCESSORIES

A. Anchoring Components
   1. Pre-manufactured support as manufactured by Safe-T-Quake or prior approvedequal

B. Thermal Expansion Absorbers
   1. Bladder type for use with potable water systems.
   2. Acceptable Models And Manufacturers -
      a. Therm-X-Trol ST-12 by Amtrol
      b. Equal as approved by Engineer before bidding.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install temperature-pressure relief valve on hot water heater and pipe discharge directly to existing floor drain.

B. Anchor water heater as specified in Paragraph 2.3-A above.

END OF SECTION 15484